

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A forging die production method comprising:
providing a cutting step which employs, as a cutting tool, a ball end mill having a surface which has undergone a hardening treatment; and in which
providing a forging die material is to be cut by the ball mill end; and, with
cutting the forging die material by controlling the ball end mill being controlled so that a length of tool extension L (mm), radius R (mm) of a cutting edge of the ball end mill, spindle speed A (rpm) and feed rate B (mm/min) satisfy $(B/A)^2 \times (L/(2 \times R)) = 0.01$ to 0.05 , and
wherein the forging die production method includes at least rough cutting, heat treatment, finish cutting and profile cutting, the cutting step is for performing the profile cutting, the profile cutting includes at least three steps wherein pick feeds in respective steps are in proportions of $(1.2 \text{ to } 2) : (0.2 \text{ to } 0.5) : (0.03 \text{ to } 0.05)$, and a feed direction includes at least one of a direction in relation to contour line processing and a direction in relation to circulation milling.
2. (currently amended): A forging die production method according to claim 1, wherein the method further comprises selecting as the forging die material to be cut a material having has a Rockwell C hardness of 45 to 62.

3. (previously presented): A forging die production method according to claim 1, wherein cutting oil is directly applied to the cutting tool so that the cutting oil flows in a downward direction during cutting.

4. (canceled).

5. (previously presented): A forging die production method according to claim 1, wherein the forging die material is cut to have a compound curvature in a corner recess through the cutting step.

6. (canceled).

7. (previously presented): A forging die produced through the forging die production method according to claim 1, wherein the forging die has a surface roughness R_{max} of 5 μm or less and is formed to have a die cavity including a corner recess of a compound curvature.

8. (canceled).

9. (previously presented): A forging die production method according to claim 5, wherein the method further comprises selecting as the forging die material to be cut a material having has a Rockwell C hardness of 45 to 62.

10. (previously presented): A forging die production method according to claim 5, wherein cutting oil is directly applied to the cutting tool so that the cutting oil flows in a downward direction during cutting.

11. (canceled).